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Payment Systems in Latin America

A Tale of Two Countries

Colombia and El Salvador

Robert Listfield

Fernando Montes-Negret

Colombia and El Salvador should consider (among other things) developing an automated clearinghouse — to make direct deposit and direct credit systems more efficient and to serve as a platform for electronic interbank payments.



Summary findings

Payment systems include all the paper (including cash) and electronic systems a country uses to exchange financial value to discharge obligations. Financial markets rely on *promptness* and *certainty* of payment and settlement for borrowing and investing. Consumers want *convenience*, *choice* (of payment options), *privacy*, and *low cost*. Inefficiencies in payment systems cause a drag on the national economy. Listfield and Montes-Negret compare trends and areas for improvement in payment systems in Colombia and El Salvador, two countries that differ in size, volume of check-based transactions, and national issues.

Check standards have developed slowly in both countries, which has retarded automation, particularly in Colombia, where the volume of checks handled makes manual processing unmanageable. Both countries need stronger leadership from central banks and bankers associations; incentives to adopt common check standards; streamlined check sorting and encoding, microfilming, and manual data processing; alternative (especially credit-based) payment mechanisms and private check-processing bureaus; and settlement of stock exchange transactions through several banks, rather than one bank.

The countries differ in important ways:

- It will be easier to reach economies of scale in check

processing in Colombia (which has too many local clearinghouses) than in El Salvador (which has too few). Both countries need a more balanced approach.

- Same day payments are possible in Colombia; payments in El Salvador are next day, at best.
- Financial markets are less mature in El Salvador and may not need to be as sophisticated as markets in other countries.

- Colombia has yet to create effective disincentives for writing checks against insufficient funds.

Both countries must take certain actions to develop a system for electronic payments and the settlement of payments at the central bank:

- Draft new laws and regulations.
- Provide more systematic data collection and analysis of payment flows.
- Undertake more risk analysis and prevention in the central banks and supervisory agencies, and draft contingency plans for major failures.
- Reexamine the dual roles of the central banks and other government agencies in operating and supervising payment systems.
- Review check-clearing pricing policies.
- Analyze the economics of automating check processing.

This paper — a product of the Financial Sector Development Department — is part of a larger effort in the department to examine factors constraining the development of countries' financial infrastructure. Copies of the paper are available free from the World Bank, 1818 H Street NW, Washington, DC 20433. Please contact Susana Coca, room G8-017, telephone 202-473-7664, fax 202-522-3198, Internet address fmontesnegret@worldbank.org. October 1995. (37 pages)

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Payment Systems in Latin America

A Tale of Two Countries: Colombia and El Salvador

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This paper is based on the findings of a short mission that visited Bogota and Cali, Colombia, and San Salvador, El Salvador in April 1995. The authors want to express their gratitude to the Central Bank of Colombia (Banco de la Republica) and the Central Bank of El Salvador (Banco Central de Reserva de El Salvador) for the excellent cooperation and warm hospitality extended to them. The authors also want to thank the numerous agencies and people visited during the mission for giving them time, sharing views, and providing detailed information.

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National authorities are placing increasing importance on the functioning of payment arrangements. Efficient and reliable payment systems are necessary for sound and efficient financial markets and for facilitating business, consumer, and other transactions. Payment arrangements often become important only when the systems have major problems or break down. But less visible inefficiencies that cause delays or increase risks can impose a significant drag on an economy.

Payment systems (plural) encompass all the paper and electronic systems used to exchange financial value in order to discharge obligations. They can be simple (cash payments for small, face-to-face consumer purchases) or complex (large electronic payments sent or received by financial institutions). The payment systems of any country evolve according to geographic, political, economic, and commercial practices. As payment systems evolve and grow, the diversity, complexity, and the interrelationships of payment mechanisms present challenging opportunities for analysis. Regardless of the composition of the systems, payment arrangements must follow six fundamental principles.

Promptness and certainty^{1/} of payments and settlement are two principles on which effective domestic and international financial markets rely on for borrowing and investing. Consumers want *convenience* (in terms of time and location), *choice* among payment options, and *privacy* and *low cost* in making their payments. These six principles determine the effectiveness of payment arrangements. These principles will be used as the main organizing criteria for the two country cases examined in this paper.

Forces driving trends in payment systems in Latin America

Several kinds of forces drive trends in payment systems: economic, regulatory, historical, demographic, social, technological, and geographic. Directly or indirectly, these forces affect the way payment systems evolve, and their effects cannot be ignored in comparative analyses. The direct forces driving payment systems trends in Latin America include:

- Integration and globalization of financial markets
- Liberalization of foreign exchange controls
- Growing importance of international trade
- Financial liberalization and increased domestic market competition

^{1/} *Certainty requires the more conventional, critical elements of reliability, accuracy, safety, security, liquidity, and finality for payment systems to operate efficiently.*

- Financial deepening and booming domestic capital markets
- Increasing complexity and diversification of domestic financial markets
- Increasing autonomy of central banks and greater reliance on indirect policy instruments for controlling the money supply
- Increasing sophistication of payment system users
- Decentralization of economic activity
- Rapid technological change reducing the cost of automation and the use of paper and allowing better and faster provision of information.

All these forces are creating new challenges and opportunities for traditional and new agents providing payment services. And the rapid change poses new challenges for the regulatory authorities, who are trying to understand and control new risks as the type, size, number, and velocity of payments and the number of participants and networks continue to grow.

Most Latin American economies have embarked in recent years on ambitious programs of institutional and economic reform. Their governments recognize that market forces must play a much greater role in mobilizing and allocating resources, free of the unsustainable administrative interventions of the past. This recognition has been prompted by awareness of the benefits of participating in larger, globalized financial markets, the futility of maintaining administrative controls, and the costs of isolation from the global economy.

To participate fully in the global economy a country must have a financial infrastructure that meets internationally accepted standards (compliance with accounting and disclosure standards, adequate legal framework and effective enforcement mechanisms for protecting business transactions, effective supervision and regulation of financial intermediaries, appropriate skills and integrity in participating financial institutions, and reliable payment systems). For this reason and because of the intrinsic merits of such a financial infrastructure, national authorities and international financial institutions like the World Bank are working to upgrade and strengthen national financial systems.

At the same time domestic financial sectors have changed significantly as a result of policies deregulating interest rates and the entry of bank and nonbank financial institutions (NBFIs) and dismantling or reducing other administrative controls (such as the allocation of credit) on the operation of financial intermediaries. These trends enhanced competition, increasing the availability and diversity of financial services and payment service providers. Privatization and the redefinition of the role of the government prompted

the rapid development of money and capital markets that are demanding new and faster payment services. These new market-driven demands and the legal and institutional reforms have redefined the role and instruments of central banks in managing monetary aggregates and in providing financial services to both traditional participants (banks) and new ones (stock exchanges, brokers, NBFIs) in the payment system.

In some countries with traditionally decentralized economic activity, rapid economic growth, and an outward orientation, the demand for domestic and international payment services has increased dramatically. The sophistication of users and the diversity of financial products require increasingly sophisticated treasury operations for financial and non-financial companies. The volume and size of payments and fund transfers are skyrocketing.

Improvements in domestic and international communications and the precipitous reduction in the cost of computers and other hardware is accelerating the trend toward the electronic transfer of funds and the dematerialization of financial transactions.

Although these forces are driving payment system trends everywhere, change has been particularly rapid in Latin America, with its sophisticated institutions and well-educated population. The speed of change can only increase. Responding to these changes and providing the new services needed requires equally rapid adaptation by central banks and other regulatory agencies. But the demand for new products and services cannot be met without first assessing the implications of the integration and sophistication of domestic and international financial markets for the safety and soundness of national financial systems.

Payment systems in Colombia

The payment system in Colombia is largely check-based, but automatic teller machines (ATMs) are prevalent and are widely used. Point-of-sale (POS) debit cards were recently introduced and are accepted at larger retail outlets in major cities. Credit cards also are used, but mostly by the more affluent.

There is no high value, same-day settlement system for customer payments, but the Central Bank has recently introduced a real-time, gross settlement (RTGS) system for transferring interbank settlements of reserve balances with immediate finality. The system, Sistema Electronico del Banco de la Republica (SEBRA), allows banks to effect transfers into and out of their (single) reserve account and obtain their reserve balance. The system is not used for transfers on behalf of customers.

Checks are cleared primarily through local clearinghouses located throughout the country. The clearinghouses are operated by the Central Bank and settled through a single reserve account for each bank. Twenty-eight clearinghouses operate in the state capitals - one in each capital - and 20 secondary clearinghouses operate outside major population centers. The 28 clearinghouses are linked with Bogota, and at the end of the first clearing the Central Bank can know the net position of each commercial bank. About 77% of the checks cleared through the clearinghouses are cleared in the country's three major cities of Bogota (43.4%), Medellin (22.4%), and Cali (11.5%). The top five cities account for 92% of clearinghouse items. Clearinghouse items are settled on a multilateral net basis with same day settlement and next-day finality through settlement at the Central Bank. Overnight overdrafts are not permitted, and in the event of a settlement failure, an unwinding of the day's transactions at the national level would be necessary.

There are four ATM and debit card networks for the settlement of interbank ATM withdrawals. All the networks are connected to allow universal interchange within the country and with international networks. Interbank and internetwork settlement takes place on a multilateral net basis through the exchange of checks.

Although the Colombian payment system is still predominantly paper-based (checks), the recently launched electronic systems for interbank transactions and for transactions in government and Central Bank paper (SEBRA) and consumer payments (private networks) are expanding rapidly (chart 1.) The Central Bank opened special accounts for stockbrokers to facilitate transactions in government and Central Bank paper (open-market operations). A new private provider of automated check processing services will start operations in Bogota shortly. Those using these services will follow the new check standards being jointly developed by the Central Bank and the Colombian Bankers Association.

A central depository for government and Central Bank paper has recently been established. The system, Deposito Central de Valores (DCV), allows the immobilization of Treasury and Central Bank debt. Primary issues and secondary sales of government paper held in book entry form is effected on a delivery versus payment (DVP) basis on the same day through SEBRA. DECEVAL, a central depository of private sector bonds and equities (as well as paper accepted by DCV) has been in operation since 1993, but these issues are held in paper form.

An electronic foreign exchange quotation and confirmation system has been organized by a private bank (CITI-INFO). A large volume of the "peso leg" of the foreign

exchange transactions is settled through SEBRA, while the "foreign currency leg" is settled abroad through Society for Worldwide Interbank Financial Telecommunications (SWIFT).

The check system

Checks are the primary form of payment between corporations and are also used heavily by consumers. Only commercial banks can offer checking accounts, many of which have overdraft privileges. Housing banks (Corporaciones de Ahorro y Vivienda, or CAVs), significant players in the financial sector, cannot offer checking accounts and are not direct members of the clearinghouses.

About 30 million checks are issued each month, of which about 60% clear through the 28 clearinghouses. About 30-40% of the checks are intrabank (on-us, that is checks for which both the payer and the payee have accounts at the same bank though not necessarily at the same branch) and are not cleared through the clearinghouses, and about 5-10% are intercity and cleared outside clearinghouses on a remittance basis.

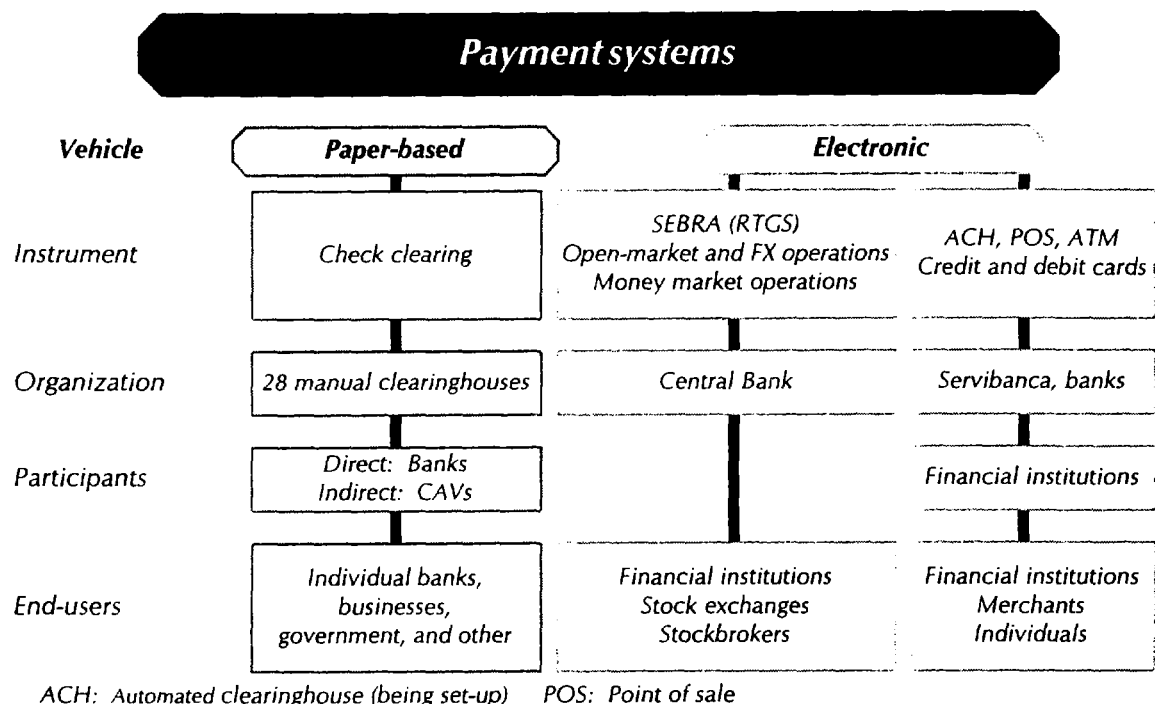
Checks are printed on security paper to reduce the risk of fraud and encoded with the bank routing, account, and check numbers in magnetic ink. Magnetic ink (MICR) standards and enforcement are incomplete, leading to high rejection rates (up to 20%) in automated processing. Checks are not returned to the customer, but archived at the paying bank branch in physical or microfilm form.

Clearinghouse operations

Each of the nation's 28 clearinghouses exchanges checks twice a day. On average, each clearinghouse has 20 member banks. The largest, in Bogota, has 37 members.

The primary clearing takes place at about 8:00 p.m. for forward collection items deposited on the same day by bank customers. Settlement for the first clearing is done on a same-day, multilateral net basis through the Central Bank. The second clearing takes place at about noon for the exchange of the previous day's return items. Settlement for the second exchange is back-valued to the previous day, also on a multilateral net basis through the Central Bank.

Chart 1 Payment systems in Colombia



The clearinghouses are owned and operated by the Central Bank. Each participating bank brings its checks, presorted by receiving bank, and covering documents to the clearinghouse by the exchange hour. The clearinghouse operator enters into a terminal each bank's deposit in each other bank in the clearinghouse. From these data the Central Bank produces a multilateral net position for each bank and a report noting the number of sending and receiving packages for each bank. The bank representatives verify the number of packages deposited and received. Clearing is accepted and the checks are exchanged if the settlement nets to zero, each bank in a net debit position has adequate funds, and each bank's number of deposit and receiving batches is correct. The process generally takes about one hour.

The Central Bank charges a fee for clearinghouse services, currently 2 Colombian pesos per million gross pesos cleared per bank.

Float

Depositing customers generally receive next-day credit to allow the returns to come back. Paying customers are charged on the date of deposit. This timing produces one day's positive float for the banking system. There is no interbank float for checks cleared through the clearinghouses.

Finality

Finality for clearinghouse checks occurs after the posting of the return items. The Central Bank verifies that sufficient funds are in the reserve account before posting. Returns are posted on the day after the forward collection item is cleared, back-valued to the clearing date. Back-valuing makes it difficult for banks to manage their reserve position because they do not know their final position for each day until the afternoon of the next-day. Because of the high level of legal reserve requirements relative to clearing value and the lagged system for computing reserves, neither overdrafts nor reserve deficiencies are common.

Check processing

Customer deposits of local checks are generally microfilmed at the branch level and are either captured and sorted by the paying bank at the branch level and consolidated at the bank's local operations center or sent to the local operations center for capture and sorting. Checks are usually microfilmed again at the operations center for reconstruction purposes and prepared for clearinghouse exchange.

Incoming checks from the clearinghouse are microfilmed and reconciled at the local operations center. Banks with automated systems usually check for sufficient funds at the operations center. Signatures are verified and pay decisions made at the branch level, requiring that the checks be returned to the payer's branch. The few banks that lack the necessary automation systems and databases to centrally verify customer account balances post the checks at the branch level.

On-us checks are generally posted to the payee and payer on the same day through automated access to a bankwide customer balance file.

Intercity checks

Checks that cannot be cleared within a clearinghouse area are collected on a remittance basis. Each bank usually mails the checks to the branch that is local for the paying bank. The checks are then cleared and settled as local items through the local clearinghouse. The clearing of intercity checks takes from 4 to 10 days.

Automation

Most banks have automated the customer posting process, either at the branch level or at the operations centers that support each of the 28 clearinghouse operations. The

check data are usually captured manually by entering the necessary data in personal computers (PCs) or dumb terminals connected to the bank's mainframe. Sorting is usually done manually.

Only about 8 of the country's 35 banks use MICR technology to encode and sort checks. Because of the relatively low volume of checks per bank and processing center, MICR processing generally is not cost-effective. Even the larger banks that use reader sorters do so only in Bogota or Bogota and Medellin. Thus most bank operations centers capture and sort checks without utilizing MICR or other automated capture and sorting technology.

None of the banks presently uses image or other technologies that would allow centralized signature verification. All checks are returned to the payer's branch for the final pay decision.

Card-based payment systems

ATMs are popular in Colombia. In mid-1994 there were more than 2,000 ATMs deployed in the country and more than 3.5 million active ATM cards. In the quarter ending June 1994 there were almost 21 million ATM transactions for an average value of about Col\$21,000 (equivalent to about US\$25 per transaction).^{2/} Four interchange networks, each owned and operated on behalf of a different group of banks, operate on a national basis. The four networks are linked to provide each cardholder with access to all of the country's machines and many in foreign countries.

Many ATM cards also can be used as point-of-sale debit cards at larger retail outlets in major cities. In the quarter ending June 1994 debit card transactions exceeded 2 million. Credit cards also are becoming more prevalent, but access to them has generally been restricted to the more affluent segment of the population. Nonetheless, at the end of 1994 there were 6.3 million cardholders in Colombia, of which 4.3 million had debit cards and 2 million had credit cards.

Both commercial and housing banks own ATMs and issue ATM cards. Cardholders can use ATMs to deposit or withdraw funds, transfer funds between accounts within the same bank, and obtain their account balance. Commercial bank customers can withdraw funds from either their checking or their savings accounts. But customers of housing bank, which cannot offer checking accounts, must make ATM withdrawals and POS debits from their savings accounts.

^{2/} During 1994 ATM transactions are reported to have reached Col\$12,749 million.

Card-based operations

ATM authorization is usually given on-line, either directly to the issuing bank's customer account database or to a negative file. All banks require personal identification (PIN) numbers for ATM cards, but PIN numbers are not universally required for POS debit cards. All ATM and POS networks are hardware encrypted for security.

On-line authorization and capture systems exist for both debit and credit card transactions. But many outlets still use manual authorization and capture devices.

Card system settlement

Each network settles on a same-day, multilateral net basis. Payment is made by the issuance of a check to the network by banks in a net debit position, and the issuance of a check by the network for the banks in a net credit position. ATM, POS debit, and credit card positions within each network are aggregated in the single net settlement.

Direct deposit and direct debit

There is not yet an automated clearinghouse (ACH) in Colombia (although one is planned), so direct debits (for example, for insurance premiums, mortgage payments, and utility bills) and direct deposits (payroll credits) can be made only on an intrabank basis. Because most consumers have a savings account at a housing bank, most direct debits and credits are transacted within the housing banks. The corporate payer (for direct credits) or payee (for direct debits) must therefore establish an account with the same housing bank or banks, where transfers are then made electronically.

SEBRA

SEBRA started operations in 1994. The system's main purpose is to electronically link financial institutions and participants in the three stock exchanges (potentially about 73 stockbroking firms) with the Central Bank, in order to speed – and increase the transparency of – the dissemination of information, reduce the paper flow, and improve the security of transactions in the interbank and government and Central Bank paper markets. The Central Bank acts as an agent of the government for the sale of government paper and undertakes significant open-market operations with its own paper for liquidity and monetary control purposes.

At present banks can consult their provisional balances (same day in batch form) and definitive balances (for the four previous days) and electronically order, on a secure on-line system, the transfer of funds to another SEBRA user to effect domestic currency (interbank market and securities) transactions and settlement of foreign exchange operations. Banks can transfer tax payments collected on behalf of the Treasury and make other transfers to service external debts, conduct other operations with the Central Bank (rediscounts), and fulfill Central Bank reporting requirements (for example, weekly foreign exchange operations). The Central Bank posts all the information on its open-market operations and accepts bids through SEBRA.^{2/} SEBRA is also linked to the book entry system managed by the Central Bank (DCV), and participants can initiate the transfer of government and Central Bank paper to other participants, with or without payment (free transfers).

The system will soon offer financial intermediaries the possibility of buying foreign exchange from, and selling foreign exchange to, the Central Bank. It will also provide on-line access to final account balances at the Central Bank, and advance notice of the banks' net balance from check clearing (before the second round of clearing). Additional services for stockbrokers and other market participants are being contemplated for the Bank's open-market operations and book entry system (DCV).

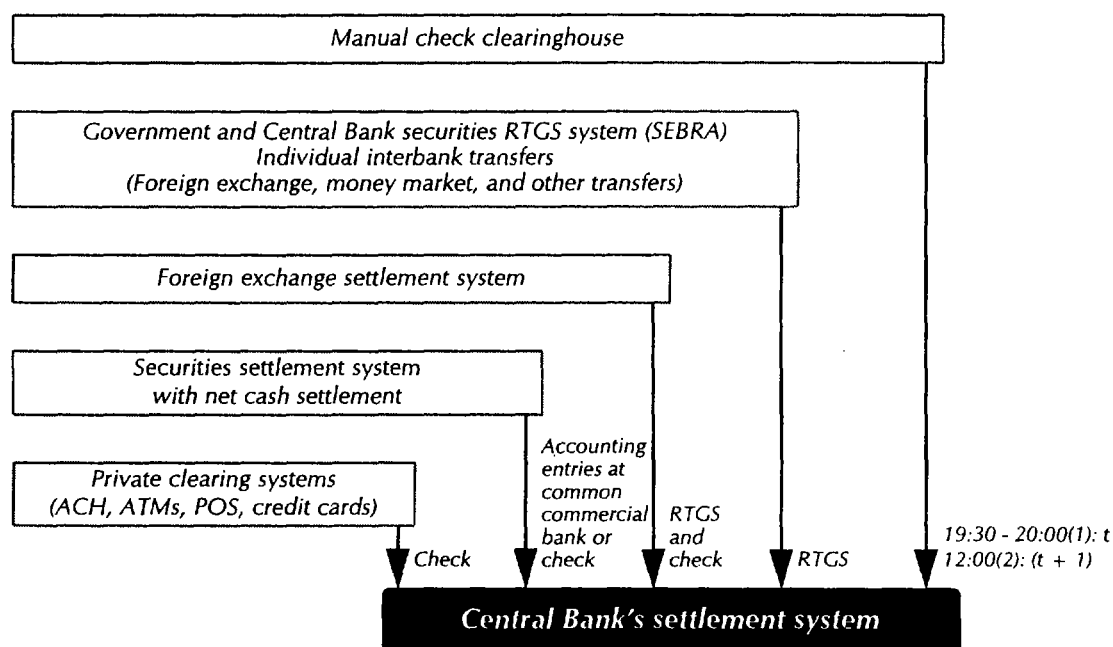
In May 1995 SEBRA had 132 participating institutions (all 31 commercial banks, 10 housing banks (CAVs), 15 of the 20 development finance institutions (DFIs), 4 finance companies, 16 of the 41 trust companies, 45 stockbroking firms from the three stock exchanges (Bogota, Cali, and Medellin), 1 insurance company, 1 pension fund, and 9 government agencies). The Central Bank estimates that SEBRA members are responsible for about 90% of the value of transactions in the country. The monthly value of transactions through the system reached Col\$5,347 billion (US\$6.7 billion) in December 1994 with about 4,200 transactions and about Col\$7,442 billion (US\$8.5 billion) in June 1995 with 6,573 transactions. The number of monthly transactions through SEBRA requiring entries in the DCV reached about 600 in December 1994, mainly for dematerialized purchases and transfers of government and Central Bank securities and payment of investments at maturity. Payments through SEBRA are expected to grow rapidly in the coming years.

^{2/} SEBRA posts the amounts offered, participants submit their bids (amounts, interest rates, and maturities demanded, and the results of the auction (individual and aggregated) are known within an hour. The system guarantees the confidentiality of individual transactions (approvals). The final step is the execution of the purchase through SEBRA by debiting the buyers' account at the Central Bank and crediting the buyers securities account at the DCV or issuing the physical title. SEBRA also provides the schedule of preannounced Treasury auctions.

Links

The central bank is at the heart of any national financial system, and its ability to provide good funds permits the required risk-free final settlement of obligations. A central bank's settlement system therefore links the different payment systems in the economy. In Colombia several kinds of settlements take place through the Central Bank's books: the final settlement of the check clearing process, the settlement of interbank transactions through SEBRA (including the settlement of most interbank foreign exchange operations), the settlement of government and Central Bank securities transfers, the net cash settlement of securities transactions and the settlement of the different private clearing systems (chart 2). Settlement mechanisms vary from the electronic RTGS system of SEBRA to settlement by check for the net position of the private clearing systems. In all cases finality is achieved once the posting takes place in the books of the Central Bank. These link could potentially create systemic risks or create a contagion effect among the different segments of the system and its participants. One function that concentrates risks is the settlement by check through a single commercial bank of all the net, end-of-day positions among the stockbrokers and the Bogota Stock Exchange.

Chart 2 Link between settlement systems in Colombia



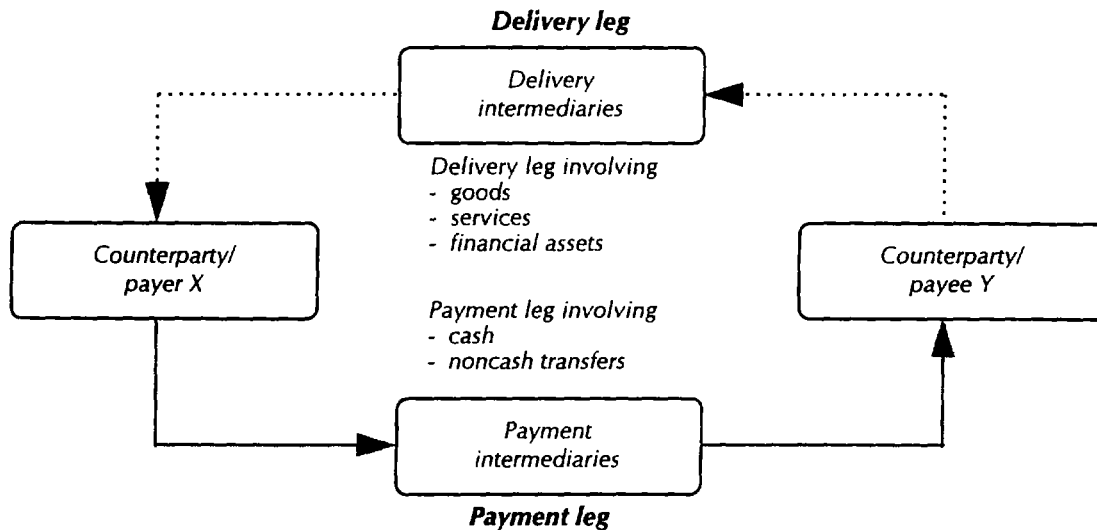
Oversight and risks

In Colombia the Superintendency of Banks is an autonomous agency attached to the Ministry of Finance. It has broad powers and overall responsibility for regulating and supervising all financial institutions, including the Central Bank. A second superintendency, Superintendencia de Valores, oversees the three stock exchanges, regulates the operations of securities markets, and supervises their participants. The Central Bank has operational responsibility for the functioning of the clearinghouses, SEBRA, and the payment system in general.

Under this institutional arrangement there are three potential risks relating to the payment systems. First, there is a risk of fragmentation in the supervisory function and limited understanding of the interconnectedness of the risks in the system. Second, the arrangement results in a tendency to emphasize ex post problem resolution and the imposition of sanctions rather than a more systematic ex ante study of the risks and ways to prevent them and the development of contingency procedures in the case of failure. Third, because the primary supervisor is the Superintendency of Banks, the focus is more on the internal safety and soundness of individual banks than on the operations of interbank clearing and settlement systems and the associated risks.

Risks can shift from one party to another and from one market segment to another (from securities dealers to banks and vice versa) in a securities or foreign exchange transaction, depending on the speed of the "delivery leg" relative to the speed of the "payment leg" (chart 3.) If the securities or foreign exchange is issued or delivered irrevocably upon confirmation of a transaction but payment is made by check, the seller assumes the credit, liquidity, and replacement risks. But if the payment leg achieves finality or irrevocability faster than the delivery leg, the buyer assumes the risks. This shift in the relative exposure of parties to a transaction until both legs of the transaction become final is frequent. In Colombia it occurs both in securities transactions through the stock exchanges and in foreign exchange transactions when the delivery leg takes place through SWIFT and the domestic payment leg by check. It is therefore important to take an overall view of risks and ensure the necessary coordination among the government agencies responsible for overseeing financial markets.

Chart 3 The structure of exchanges



Payment system issues

In Colombia's payment system because it is largely check-based, most of the issues and problem areas lie in the check system. Although settlement for most checks takes place on a same-day basis, the largely manual nature of the operations results in many inefficiencies and control problems. On a nationwide basis the volume of checks does not justify the huge expenditure required for automation. But the operations of large banks in major cities could benefit from better-defined standards and greater enforcement of existing standards, with respect to both MICR and manual procedures.

Following are the most significant issues and areas for improvement in the Colombian payment system. Many of these issues are being studied by the Colombian Bankers Association, the Central Bank, and other interested parties.

- *Lack of automation in check processing*

Although the check is the primary form of payment in Colombia, for most banks in most clearinghouse areas the volume is not sufficient to justify automation. For all but three largest clearinghouses, the average check volume per bank is no more than 1,000 per day. Thus only the largest banks in the largest cities can justify the big investment in MICR technology. But

to achieve maximum benefit from the technology, all check issuers would have to incur the cost of issuing checks with high-quality MICR and all depositors would have to encode the amount field. The lack of automated processing means that data must be manually entered several times (at the depositing and paying banks).

- Lack of standards or enforcement of standards for manual and automated processing

The lack of a robust set of standards has delayed automation in check processing and has increased reconciliation problems for both automated and non-automated banks.^{4/} For example, the lack of standards for the size of checks, the poor quality of pre-encoded checks, and the absence of widespread encoding of the amount field lead to rejection rates for reader sorters of about 20%.^{5/} In addition, banks do not always provide list of checks in the same order as the checks are presented, adding significant time and costs to the reconciliation by the receiving bank.

- Poor quality of check processing

In a related issue, the combination of high volume, manual processing, and tight processing time frames leads to many errors in the check collection process. Checks are often missing from packages or sent free (i.e., by mistake.) Errors in amount or paying bank also are quite common. And once errors are detected, there are no standard procedures for reporting and promptly resolving them.

- High volume of return items

The percentage of checks returned nationwide, usually because of insufficient

^{4/} In consultation with the Bankers Association, the Central Bank is in the process of issuing mandatory check standards and new rules for the clearinghouses that would allow direct access by the housing banks to the clearing process.

^{5/} Compared to rejection rates of 1-2% for the USA and Mexico. To reduce rejection rates the Centro de Computo Bancario (CEBOBAN) in Mexico offers a quality-control service to printers, banks and corporations checking the quality of paper, magnetic ink and the overall quality of the checks, resulting in a significant reduction in the rejection rate since 1992. Banks exceeding certain maximum rejection rate are fined.

funds, is estimated at 5 to 10% by volume and about half that by value.^{6/} In Cali, for example, the return rate over two months was 11% by volume and 4% by value. This high rate of returns adds to the risk of the payment system and to the cost of the check system.

- Delays in clearing inter city checks

The method for clearing intercity checks, which includes the use of mail, delays the clearance of these checks and adds to the cost of check handling. With postal delays and the high percentage of return items, it can take more than a week for intercity checks to clear.

- Lack of direct access by housing banks to clearinghouse services

Housing banks play a significant role in Colombia as financial depositories for the household/consumer sector. Although they are not authorized to provide checking accounts, they receive many checks from their customers that require clearing. Lacking direct access to clearinghouses, they must clear checks through a member commercial bank, a process that delays the clearance of these checks. Moreover, since housing banks need cash advances (equivalent to bank credits, backed by the checks being cleared from their clearing banks) each clearing bank faces a limit (based on its capital) on the value of the checks that it can clear at one time for housing banks. Large housing banks must therefore use several clearing banks, making the process more cumbersome and expensive.

Because housing banks lack authority to provide checking accounts, it is unclear whether they should receive direct paper check access to clearinghouses. But they are also important players in direct debit and credit services, and direct access to future ACH services, if not for paper clearing, must therefore be considered for them.

- Lack of an automated clearing house

The lack of an ACH facility precludes the use of direct deposit and direct credit services on an interbank basis. These services can only be conducted on an intrabank basis, which requires that the initiator of a transaction

^{6/} Compared to 1-2% by volume in the USA and about half that by value.

maintain accounts at each financial depository with whose customers it has transactions.^{2/}

- High cost of making payments

The cost of checks and ATM transactions is relatively high in Colombia. A check typically involves a direct cost to the issuer of about Col\$550 (about US\$0.66) on top of the financial cost of keeping a high minimum account balance. ATM transactions cost Col\$673 per transaction, or about US\$0.80, and there is also a Col\$4,500 quarterly card management fee. To help cover the higher processing costs for checks (partially reflecting the multiple processing of checks, due to the high volume of returns), surcharges should be better targeted. The clearinghouses could levy higher surcharges on banks with higher-than-average return rates for checks to encourage banks to pass on at least some of the extra cost to their customers and to be more selective in their clientele. More standardization and automation and increased competition should help reduce transaction costs.

- Lack of a system for same-day finality for customer payments

The only system providing same-day finality is SEBRA, used largely for bank-to-bank payments.^{3/} Many high-value payments are settled by check, for which only next-day finality is available. Banks and bank customers appear to be conservative with regard to providing delivery of goods and services before receipt of final payment. Nevertheless, the cash management needs of large corporations and the growth in financial markets may soon lead to a need for a full-fledged large-value transfer system (LVTS) for same-day finality.

Possible improvements to the payment system

The growth in volume and value in the check and other payment systems has opened opportunities to improve the efficiency and quality of the payment system. Because the check is the primary payment instrument now in use, initial improvement efforts should

^{2/} A recent U.S. survey of personal check use (the AZTEC Project) shows that one-third of checks are issued to pay recurring bill payments that can be replaced by ACH payments, and another one-third of checks are issued for POS purchases which can be replaced by plastic cards.

^{3/} SEBRA can be used by banks for large, time-critical transfers from one bank client to a client at another bank. But even though banks have been informed about this option, they rarely use it.

probably focus on check clearing. As automation of the banking system increases, however, introducing an ACH service could reduce significantly the burden on the check system.

The opportunities for improvement discussed below should not be considered recommendations but are presented only to provide guidance to the Colombian payment system experts based on experience in other countries. Final decisions on enhancements to the Colombian system must be based on more in-depth analysis of the needs and capabilities of the payment system users and providers.

The discussion of opportunities for improvement addresses several of the key issues noted above. These issues can be grouped into several major categories:

- Barriers to automation of check processing
- High processing error rates that add to processing workloads
- High levels of returns that lead to greater risk for payment system end users and higher operating costs for payment system providers
- Delays in the clearing of intercity checks, which add uncertainty to check collection times
- Lack of an interbank direct debit and credit system
- Credit-based payments (GIRO).

Barriers to automation of check processing

Several factors in Colombia have delayed the move to automated check processing. Some of these factors, such as the absence of robust, well-enforced standards to facilitate automation, are obvious. Others are more subtle. For example, most banks in Colombia are too small to justify the cost of MICR or other automated check processing technologies and therefore lack the incentive to adopt standards that could be seen as benefiting only the larger banks.

Thus eliminating the barriers to automation might require a two part effort: first, developing standards that will allow efficient automated capture and sorting of checks and, second, creating incentives to ensure that all banks enjoy the benefits of automation. Indeed, the creation of incentives should probably precede the development of standards so as to encourage all banks to participate by adopting the standards for automation.

Incentives to distribute more widely the benefits of automation can come in two forms: those related to scale economies, and direct financial incentives.

- Scale incentives

Automated check reading and sorting technology requires a large fixed investment. Although total check volume in Colombia is substantial, it is divided among the 31 banks and further divided among the 28 clearing centers. That leaves only the largest banks in the largest cities able to justify the investment in automation.

One possible solution to this scale problem is the creation of check processing service bureaus in local clearinghouse areas that could process the checks on behalf of some, if not all of the area banks. This concentration of volume, which would enable more banks in more locations to enjoy the benefits of automation, is starting to happen with the establishment of a private service bureau in Bogota.

Another possible solution, one that could perhaps be used in conjunction with service bureaus, would be to reduce the number of clearinghouses. Smaller clearinghouses could perhaps be merged with another clearinghouse within reasonable distance. Combining clearinghouses would provide the greater volume needed to justify automation. To reduce courier costs for branches in an area with a closed clearinghouse, the old clearinghouse could be used as a relay station where all the checks from the area would be consolidated and shipped in a single vehicle to the merged clearinghouse or service bureau. The time lost in shipping to the new location and the cost of the courier might be more than recovered through the gain of obtaining access to automated processing.

- Direct financial incentives

Direct financial incentives can be positive or negative. An example of a positive incentive is to have automated receiving banks compensate non-automated senders for encoding checks. An incentive fee that is less than the value received by the automated receiver but greater than the cost to the originator would benefit both parties. Negative incentives could include delaying availability one day for not adhering to standards or charging a penalty for deposits with high rejection rates.

The incentives described above are meant only as suggestions. The key point is that automated check processing can progress more rapidly if incentives are created to

spread the benefits as widely as possible.

High processing error rates

Many of the error problems in the payment system should be resolvable through greater use of automation. But until automation is universal, strict check quality standards and enforcement procedures must be adopted. For example, at a minimum, all check deposits should be accompanied by a list of the check amounts in the same order as the checks are presented, a requirement that would greatly reduce the time needed for reconciliation. Second, standard forms should be used to report such errors as missing checks, free checks and errors in amount. Although such a form would not reduce the number of errors, it would aid in their resolution. To encourage further quality improvements, penalties could be imposed on banks with excessively high error rates (a practice used in Mexico.)

Another possible way to reduce error rates would be to encourage a courtesy exchange of checks at the secondary (noon) clearing hour. This courtesy exchange would give receiving banks more time to process their in-clearings and perhaps lead to fewer returns and better work flow management.

High levels of return items

The percentage of return items by volume in Colombia is close to five times that in the United States. Although payment system regulations require banks to close the accounts of customers who write an excessive number of checks against insufficient funds, the requirement does not seem to be enforced. Banks should consider greater use of penalties to reduce the number of returned checks. For example, banks could charge customers who write checks against insufficient funds a stiff fee, or they could be required to close accounts on which more than three checks are written against insufficient funds within a year. In addition, the clearinghouse could charge a fee for each return to the bank whose customer caused the return. But this option should be implemented carefully because it is sometimes difficult to identify the guilty party. For example, a stale-dated check can be the fault of the payer (who wrote the wrong date) or the payee (who delayed the deposit of the check).

Role of the Central Bank

Different countries have adopted different roles for their Central Banks in the operation and ownership of their payment systems. Some central banks have held onto

critical segments of the system, particularly LVTS (for example, Fedwire and BOJ); others retain only a supervisory role (for example, in the United Kingdom). In Colombia the Central Bank has traditionally played a dominant role, but more recently new systems are being developed in which it provides finality of payment. In principle the establishment of a private ACH is a welcome development, but its operating rules and the supervisory and regulatory framework still need to be developed. The situation for the ATM networks in operation is similar.

ACH and GIRO systems

An ACH would eliminate the present cumbersome need for a party wishing to effect a direct debit or direct deposit transaction to have an account in the same bank as the payer or payee. It could also aid the development of a credit-based payment system.

Although Colombia's payment system will continue to be largely check-based, more could be done to promote alternative payment options, including the development of a credit-based system. Such a system might be particularly appropriate given the problems (fraud, high rate of returns) with checks and the high costs of automation. A GIRO system would facilitate the truncation^{9/} of paper-based payments or a direct move to electronic systems, and should be considered before a major investment in paper check processing.

Legal and regulatory development

Electronic payment is a new development in many countries, and regulators still need to "catch up" with the speed of technological change and financial innovations. One area in which increased attention might be warranted is the drafting and approval of a body of legislation to define the rights and obligations of the different participants in the payment system.

Information gathering and risk assessment

There is much room for improvement in the collection and analysis of payment system information by instrument, region, type of institution, and so on. This information is needed to forecast expansion requirements and guide the supervisory process.

^{9/} When the physical movement of paper payment instruments (e.g., paid checks) is curtailed or eliminated, being replaced, in whole or in part, by electronic records of their content for further processing and transmission.

Moreover, Central Banks need to simulate "worst-case scenarios" and prepare contingency measures or adjust their existing procedures in order to mitigate existing or potential risks. A simple exercise that the Central Bank might undertake is to examine the past performance of banks in the clearing and settlement process and determine their largest net debit position (especially for major banks) at any time in the clearing and settlement cycle as a proportion of their total reserve requirements at the Central Bank. This exercise is important in assessing the credit risks assumed by the Central Bank.

The payment system in El Salvador

The payment system in El Salvador is largely check-based. Yet the use of checks, although the primary form of noncash payment, is low by the standards of more developed countries, particularly for individuals. Only about 30% of households have checking accounts, compared with 80-90% in more developed countries. Most of the payment system processing is done manually.

ATM and credit cards are available but not widely accessible. Only about 50 ATMs are in use in all of El Salvador, most (20) in the capital city of San Salvador. Some credit cards are issued, mostly to the more affluent. Point-of-sale debit cards do not yet exist. There are no electronic links from the Central Bank to the commercial banks, and therefore no same day high value payment system.

The one formal clearinghouse in the country is located in San Salvador and operated by the Central Bank, Banco Central de Reserva de El Salvador (BCRS). Settlement for the clearinghouse takes place on a same-day, multilateral net basis. The settlement is posted to the single reserve account maintained by each bank. Outside San Salvador check exchanges take place directly between commercial banks.

The banking structure

There are 9 commercial banks, one development finance bank (DFI), and 8 savings banks (with no check issuing power) in El Salvador. Of the 9 commercial banks in El Salvador, all but one are domestic. The one foreign bank focuses on an upscale client base and requires a high minimum account balance. At the end of 1994, assets in commercial banks totaled 32.4 billion colones (C) (about US\$3.4 billion). The largest bank in El Salvador holds about 27% of the banking industry assets, and the top four have about 77% of the assets.

The BCRS maintains operations only in San Salvador and had no branches. Although there is no separate deposit insurance fund in El Salvador, the BCRS insures up to C40,000 (about US\$4,600) per account. Banking hours are generally 9:00 a.m. to 3:00 p.m. Monday through Friday. But banks have flexibility in setting their operating hours, and some banks keep selected branches open as late as 6:00 p.m.

Each commercial bank maintains a single reserve account at the BCRS, used for both reserve and settlement purposes. Required reserves are based on a percentage of customer deposits, as follows:

- 30% of current account deposits
- 20% of savings account deposits
- 15% of time deposits
- 50% of foreign exchange deposits.

Because of the high reserves and the relatively low value of checks cleared, overdrafts of reserve accounts are not deemed a problem.

Most banks have automated their internal customer accounting systems. But only the largest and most sophisticated have centralized databases that enable them to access customer balances centrally and make electronic intrabank transfers. Most checking account customers are businesses. At one of the largest banks in the country about 60% of the checking accounts belong to businesses and 40% to individuals.

The check system

Besides cash, checks are the primary means of making payment in El Salvador. About 1 million checks are cleared monthly. About 70% of these checks are cleared through the nation's only clearinghouse, in San Salvador. The clearinghouse is operated by the BCRS, with settlement on a same-day, multilateral net basis. The rest of the checks are exchanged directly between banks in informal regional exchanges. Settlement for these direct clearings is done by check through the San Salvador clearinghouse.

With no nationwide standard for machine-readable coding on checks, check processing is largely a manual operation. Checks deposited by and drawn on customers of the same bank (on-us checks) are generally cleared by on-line systems within that bank. Some banks return paid checks to the customer.

Clearinghouse operations

At the one formal clearinghouse in El Salvador the largest bank deposits only about 8,000 checks daily and receives about the same number. The primary clearing is held at 8:00 a.m. for same-day settlement but with 9:00 a.m. next-day notification of finality. Settlement takes place through each participating bank's reserve account on a multilateral net basis. Overdrafts are not permitted, and banks would have to obtain funds to avoid them. Because of the high required reserves relative to daily clearings, however overdrafts do not occur.

The San Salvador clearinghouse has a secondary clearing at 5:00 p.m. for the returns generated from the primary clearing. These returns also are settled on a same-day, multilateral net basis with 9:00 a.m. next-day finality.

As a result of this schedule, a customer who deposits a local interbank check on day 1 will receive credit on day 3. The account of the check issuer will be debited on day 2, resulting in one day's positive float for the banking system.

Day 1	Day 2	Day 3
	8:00 a.m. primary clearing	9:00 a.m. notification of prior day settlement
	5:00 p.m. return item clearing	
<i>Client deposits check</i>	<i>Debit check issuer</i>	<i>Credit check depositor</i>

Clearinghouse operations are largely manual. Each participating bank submits a sheet showing the volume and value of checks drawn on the other clearinghouse participants. These deposit sheets are manually entered in PCs by BCRS employees. On verification of a zero net position and of adequate funds in each bank's reserve account, the exchange takes place. The BCRS does not charge fees for its settlement services.

The BCRS acts as agent for the government agencies that issue checks, which the BCRS receives through the clearinghouse and sorts manually by issuing agency.

Returned checks

Only about 1-3% of checks are returned in El Salvador. The banks levy a penalty (about C\$10, or US\$1.20) on customers who write a check against insufficient funds and often close the accounts of habitual offenders (those who write three or more bad checks within a year). The greater care taken by banks in El Salvador in advancing funds

and their larger penalties for writing checks against insufficient funds are said to stem from the significant losses suffered by several banks in the past by advancing against uncollected funds.

Check processing

Virtually all check processing is done manually. Although standards exist for the positioning of information on checks, there are no industry-wide standards for check automation. Some banks have begun to use MICR for processing their own checks, but because of low volumes automation of check processing by individual banks, would bring at best only marginal cost benefits.

Only the largest banks in San Salvador microfilm checks. But branches often photocopy large-value checks.

Most banks have automated their customer deposit accounting system. But only the four largest banks have centralized computer systems that allow centralized verification of balances and on-line posting of on-us checks. The limitations of telecommunications and other infrastructure sometimes prevent same-day clearing of on-us checks, however.

Card-based payment systems

ATMs

El Salvador has only about 50 ATMs. One of the largest banks runs its own ATM systems, and all other banks participate in a shared ATM network. The shared network charges C7.25 per transaction (about US\$0.80). Many banks' ATM cards are basically credit cards allowing ATM access.

Credit cards

Credit card use is also low in El Salvador and automation quite limited. There are only about 600 POS terminals for credit card authorization in the country. These terminals are off-line and operate against a negative file.

Direct deposit and direct debit

Direct deposit (for example, for payroll) and direct debit (for utility payments)

are possible in El Salvador only on an intrabank basis. Originating companies have an account at each major bank and provide paper lists of recipients (direct credit) or payers (direct debit) to the bank. The bank then makes the transfers.

No plans exist for an ACH or other interbank system for direct debits and credits.

Payment system issues

As might be expected, most of the issues needing to be addressed in El Salvador's largely check-based payment system are associated the check system. Following are the most significant payment system issues.

- *Lack of automation in check processing*

Although the check is the primary form of payment, for most banks the volume of checks is not sufficient to justify automated processing. Even at the largest banks the average daily volume is no more than a few thousand checks. Only these few banks can hope to justify the high investment in MICR technology. Yet achieving maximum benefit would require that all check issuers incur the cost of issuing checks with high-quality MICR and that all depositing banks encode the amount field.

The potential for automating clearinghouse exchange and settlement operations seems greater in the near term. Most banks have sufficient technology to communicate data or at least to provide a diskette with the information needed for clearinghouse settlement. Automation of clearinghouse settlement could reduce the time needed for settlement and enhance the efficiency and control of the process.

- *Lack of standards for automated processing*

The lack of nationwide standards for check encoding has delayed, and will continue to delay the move to automated processing of checks. The bankers association is not perceived as strong enough to achieve consensus on this issue, and the BCRS has not yet taken active steps to foster industry-wide improvements in the payment system.

- Length of check clearing cycle

Three to four days lapse between the deposit of a check by a customer and the customer's receipt of the funds. Greater automation might speed this process, but wide-scale use of automation is not likely in the near term. Changes that are possible in the near term, however, such as introducing a night cycle for primary check clearing, could reduce the check clearing time by as much as a day.

- Lack of a nationwide clearinghouse capability

With only the single clearinghouse in San Salvador, other areas of the country rely on bilateral exchanges for local checks, with settlement by check. Although banks apparently like these bilateral exchanges, the exchanges entail risk to the banking system. In particular, the direct exchanges out of San Salvador are settled by a check or money order drawn on the bank in a net debit position. The use of a check for settlement delays the finality of payment and the granting of credit to the depositor and increases the risk of settlement failure.

- Lack of an ACH facility

The lack of an ACH facility precludes direct deposit and direct credit services on an interbank basis. These services must be conducted on an intrabank basis, requiring the initiator of transactions to maintain accounts at each financial depository at which it wishes to access a customer.

- Lack of a system for same-day finality for interbank customer payments

There is no mechanism for providing same-day finality for interbank customer payments. Many high-value payments are settled by check, for which only next-day finality is possible. Banks and bank customers appear to have a conservative attitude about the delivery of goods and services before receipt of final funds. Nevertheless, the growth in financial markets (including the expansion of the BCRS's open-market operations) and the cash management needs of large corporations may soon lead to a requirement for a system providing same-day finality.

The risks posed by the lack of a system for same-day finality are apparent in

the settlement of stock exchange (Bolsa) transactions. First, because of the lack of a same-day interbank settlement capability, all Bolsa payments are settled on an intra bank basis, on the books of a single bank. This requires that all brokers maintain an account at that bank. Centralizing the Bolsa settlement in this way, concentrates risk in the event of a failure of the settlement bank. Second, the system is vulnerable to a loss of same-day settlement if the settlement bank elects to eliminate the service because of concerns about its own risks.

Possible improvements to the payment system

In El Salvador, just as in Colombia, initial efforts to improve the payment system should probably focus on check clearing. But as automation increases in the banking system, introducing an ACH service becomes important as a way to reduce the burden on the check system.

The suggestions below address several of the key issues discussed above. They are intended only to provide guidance to El Salvador's payment system experts based on experience in other countries and should not be considered recommendations. The final enhancements to the national payment system must be based on more in-depth analysis of the needs and capabilities of payment system users and providers in El Salvador.

Overcoming barriers to automated check processing

The lack of automation standards in El Salvador has inhibited a move to automated processing of checks. Despite the lack of standards some banks are already moving toward MICR encoding of checks and automated processing. To avoid a situation in which banks follow different standards, making the move to a uniform standard more difficult, a single national standard for check automation should be adopted as soon as possible. If that is to happen, the Central Bank may have to take a more active role.

Other barriers to automation must also be addressed. A principal barrier is that most banks in El Salvador have too little volume to justify the cost of MICR or other automated check processing technologies and therefore lack the incentive to adopt standards that could be seen as benefiting only the largest banks, if any.

As in Colombia, eliminating barriers to automation may require a two-part effort: developing standards for efficient automated capture and sorting of checks, and ensuring, through incentives, that the benefits of automation are enjoyed by all participating

banks. Priority should probably be given first to creating incentives, so as to encourage all banks to adopt the automation standards.

The incentives for automation include incentives related to scale economies and direct financial incentives.

- Scale incentives

Automated check reading and sorting technology requires a large fixed investment. Although total check volume in El Salvador may justify automation, the volumes at most individual banks do not.

One way to solve this scale problem is to create check processing service bureaus that could process the checks on behalf of some or all of the banks. This concentration of volume would enable more banks to enjoy the benefits of automation.

Another way is to eliminate the direct bilateral exchanges in favor of a single nationwide clearinghouse. The country is not so large that transportation to San Salvador is impractical. To reduce courier costs for branches in remote areas, conveniently located relay stations could be established at which all of an area's checks could be consolidated for shipping in a single vehicle to a national clearinghouse or service bureau. The time lost in shipping to the new location and the cost of the courier might be more than compensated for by the access to automated processing.

- Direct financial incentives

As in Colombia, both positive and negative direct financial incentives could be used. A positive incentive could be created by having automated receiving banks compensate nonautomated senders for encoding checks. An incentive fee less than the gain to the automated receiver but greater than the cost to the originator would benefit both. A negative incentive could be created by delaying availability of funds for one day for not adhering to standards or charging a penalty for deposits with high rejection rates.

Shortening the check clearing cycle

With the primary clearinghouse exchange at 8:00 a.m., all checks are cleared

at least one day after deposit at the bank. But the country is not so large nor the volume of checks so great as to preclude an evening exchange for same-day checks (as in Colombia.) This evening clearing time could make the funds for most checks available one day earlier.

There are several possible ways to make this change:

- An additional clearinghouse exchange could be added at, say, 8:00 p.m. for same-day checks. Banks that can meet this deadline would exchange their checks at 8:00 p.m. for same-day credit. The present 8:00 a.m. primary and 5:00 p.m. secondary exchanges would remain, although returns from the new evening exchange might be included in the 8:00 a.m. primary exchange.
- A new 8:00 p.m. exchange could be reserved for reasonably-high value items to provide a mechanism for same-day value without imposing undue processing burdens. Indeed, installing some form of same-day settlement capability, even if only by check, might delay the need for a separate, expensive high-value payment system.
- A third alternative would be to keep the two clearinghouse exchanges, but change the times so that the evening exchange would be the primary one and the morning exchange would handle the previous day's return items.

Providing same-day settlement capability

In the short term changes to the clearinghouse cycle that would allow same-day settlement of checks might be adequate for the limited volume of financial market and other transactions now requiring same-day settlement. But thought should be given to creating electronic links between the Central Bank and the commercial banks to provide a mechanism for better monitoring of reserve balances and the transfer of interbank funds on a same-day basis.

Automating clearinghouse settlement operations

Consideration should also be given to introducing greater automation into clearinghouse operations. At a minimum, each bank should be required to bring a diskette with their clearinghouse exchange information to the clearinghouse. For most banks this should not be difficult, and it would eliminate the need for the Central Bank to manually enter all the data, which is time consuming and error prone.

In larger cities consideration should be given to requiring that the clearing exchange information be transmitted to the clearinghouse about 15 to 30 minutes before the clearing hour. That would allow the Central Bank to process the information and check balances before the arrival of the checks, shortening the clearinghouse exchange process dramatically.

Providing ACH capability

An ACH allows the exchange and settlement of electronic payments processed in batch form. Such a facility is best suited for recurring payments, such as salaries and utility bills. An ACH may also handle paper-based payments that can be truncated and cleared and settled in electronic form (usually credit based payments).

Presently there seems to be little demand in El Salvador for such a capability. But many countries are now instituting an ACH capability, which can be done on almost a "turnkey" basis. Creating an ACH capability may relieve some of the pressure for expensive upgrades to automate the check system, particularly if businesses can be encouraged to move to credit based payments.

Introducing credit-based payments

Check-based payment systems, although convenient and quite popular, have two major flaws compared with credit-based systems:

- First, check-based systems have the potential to result in return items because the sufficiency of funds and the maker's signature cannot be verified until after the check has been cleared.
- Second, checks are harder to truncate at the bank of first deposit because of the need to verify the check writer's signature. Early truncation would aid automated clearing and settlement (for example, through an ACH facility).

Because the check system is relatively immature (lack of automation, low payment volume, limited consumer use) it may be desirable to create a system involving greater reliance on credit-based payments and the incentives to move toward it. A study on the feasibility of such a system should commence quickly, as the longer the country waits, the more committed (financially, technically, and by user preference) it will be to the check system.

Improving external payment services and controlling risks

Since December 1994, the BCRS has been running an electronic quotation and transaction system known as Sistema de Negociacion Electronico de Divisas (SINEDI). The system is reported to be underutilized, processing only about five transactions a day for about US\$0.5 million. The domestic payment leg of the transactions is settled by certified check, and the foreign exchange delivery leg by fax instructions to be executed through a commercial bank in Miami. No SWIFT connection exists. The difference in speed between the two legs could potentially create serious risks.

Concluding remarks

Colombia and El Salvador, despite differences in their size, volume of transactions of their check-based payment systems, and national issues, share common opportunities for improvement.

- Check standards have developed slowly. This slow pace has retarded automation, particularly in Colombia where manual processing has become unmanageable for the volume of checks that must be handled. More leadership from the central banks and the bankers associations may be needed to bring about consensus.
- The right incentives (positive and negative) should be created to encourage banks to adopt common check standards.
- Significant benefits could be gained at low cost by reducing the duplication of steps in multiple sorting and encoding of checks, microfilming, and manual data processing at the clearinghouses.
- Developing and promoting alternative payment mechanisms, particularly credit-based, and speeding the establishment of ACHs and private check processing bureaus could reduce the pressure on the check clearing and settlement process.
- Instead of having a single bank for settling stock exchange transactions, concentrating risks in the settlement process, possibly several banks should participate, settling payments through SEBRA.

In addition to the strong similarities between the two countries, payment systems, there are also important differences:

- It will be easier to reach economies of scale in check processing in Colombia than in El Salvador. Colombia has too many local clearinghouses, and El Salvador has too few. For both, a more balanced approach might be beneficial.
- Colombia has a capability for same-day payments through either the check clearinghouse or SEBRA. Payments in El Salvador are, at best, settled next-day.
- Colombia's Central Bank is better equipped to undertake open-market operations and, through SEBRA, it has a more efficient interbank market than El Salvador. Financial markets in El Salvador are less mature and do not have, and may not need, the sophistication seen in other countries.
- Returned items in Colombia are well above reasonable levels for efficiency and for continued broad acceptability of checks. Surcharges for returned checks have been used effectively to create disincentives for writing checks against insufficient funds.

The development of electronic payments and the settlement of payments at the central bank in Colombia and El Salvador will require action in several areas:

- New laws and regulations need to be drafted.
- More systematic data collection and analysis of payment flows (by instrument, locality and system) are needed for planning and risk control purposes.
- The central banks and supervisory agencies need to undertake more risk analysis and prevention activities and draft contingency plans for major failures.
- Both countries should reexamine the dual role assigned to the central banks and other government agencies (such as superintendencies of banks) in operating and supervising payment systems. The objectives of such an assessment would be to clearly define the opportunities and duties of private operators (ACH) and to avoid supervisory fragmentation.

- Pricing policies for check clearing pricing policies should be reviewed. In El Salvador the issue is setting processing fees for BCRS services. In Colombia the issue is setting penalty charges for banks with above normal rates of returned checks.
- Both countries face a major investment decision with respect to automating check processing. There are two key questions: How can cost-effective automation be achieved given the low volume of checks by bank and by operating center? And would it be better to bypass major check processing investments in favor of electronic alternatives?
- Both countries should consider developing an ACH, which would make the direct deposit and direct credit systems more efficient and could serve as a platform for electronic interbank payments.

Key payment system statistics for Colombia and El Salvador

Item	Colombia	El Salvador
Check volume (monthly)	30 million	1 million
Checkclearinghouses (primary)	28	1
Hours Primary clearing (t) Secondary clearing (t + 1)	8:00 p.m. 12:00 a.m.	8:00 a.m. 5:00 p.m.
Finality	Same-day funds, next-day finality	Next-day funds, next-day finality
Commercial banks	31	10
Housing or savings banks	10	8
ATM networks	4	2
ATMs	2,000 +	50
Electronic link (central bank-financial system)	SEBRA	None

Economic and social indicators for Colombia and El Salvador

Indicators	Colombia	El Salvador
Area (square kilometers)	1,141,567	21,000
Cities with more than:		
5 million inhabitants	1	0
1.5 million inhabitants	2	1
1.0 million inhabitants	1	-
0.4 - 0.5 million inhabitants	6	-
Population		
1993	35,682,000	5,479,000
Annual percentage rate of growth	-	1.8
Life expectancy at birth (years)	69	66
Primary school net enrollment (% net, 1991)	74	71
Illiteracy rate (percent)	13	27
The economy		
GNP (US\$ millions, 1993)	50,119	7,233
GNP per capita (US\$)	1,400	1,320
Real growth rate (percent, 1985-93)	6.5	1.2
Average inflation (percent, 1985-93)	25.6	16.9
Interest rates (annual, percent, February 1995)		
Discount rate	41.3	-
Deposit rate	34.3	13.21
Lending rate	44.8	19.38
Foreign exchange (US\$ millions, April 1995)	7,889	659
1994 monetary survey		
(C\$ billions, millions of colones)		
Domestic credit (amount, annual)	13,339.3 (51.2)	26,749 (28.3)
Money (M1)	6,695.0 (30.4)	7,802 (6)
Quasi-money (M2)	6,253.3 (51.4)	21,897 (32.7)
Money market instruments	863.0 (-18.0)	-
Bonds	220.3 (216)	2,936 (-15)

- Not available.

Note: Figures in parentheses are annual percentage rates of growth.

Source: World Bank, the World Bank Atlas 1995; International Monetary Fund, *International Financial Statistics*; World Bank staff estimates

Structure of the financial sector in Colombia, 1994

Type of intermediary	Number	Branch	Staff	Assets (Millions of US\$)
Banks	34	3,025	63,318	18,919,872
DFI (corporaciones financieras)	21	146	3,095	3,422,354
Housing banks (CAVs)	10	1,152	19,377	6,814,335
Cooperative banks	1	103	1,665	248,459
State Housing Bank (BCH)	1	136	2,723	1,124,843
Special state financial institutions				
BANCOLDEX (Exim Bank)	1	1	169	1,085,338
FINDETER (regional investment bank)	1	1	203	262,995
FEN (power sector)	1	1	162	1,712,169
FINAGRO (rural finance)	1	1	66	811,336
FONADE (project identification)	1	1	79	37,427
IFI (industrial finance)	1	1	268	634,336
Pension funds	16	167	7,754	71,045
Fiduciary companies				144,637
Trusts	43	43	-	6,040,000
Finance companies and leasing companies*	74	316	4,495	3,109,127
General insurance companies**	34	-	-	2,356,498
Life insurance companies**	21	-	-	902,681
Reinsurance companies	3	-	-	512,385

- Not available.

* Commercial finance companies

** General insurance companies

Structure of the financial sector in El Salvador, 1994

Type of intermediary	Number	Branch	Staff	Assets (Millions of US\$)
Banks	9	149	8,221	3,443.21
Financial institutions	6	41	1,595	561.37
Cooperative banks				
Fedecredito	1	1	259	43.39
C. Crédito y Banco Trabajadores	2	57	716	62.73
State Financial Institution				
Banco Hipotecario	1	13	868	259.26
Banco de Fomento Agropecuario	1	27	1,442	159.04
Fiduciary companies*	-	-	-	-
Insurance companies	14	14	-	182.1

- Not available

* Most banks hold fiduciary operations

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